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ANNUAL REPORT

ON THE

MEDICAL RESEARCH INSTITUTE

FOR THE YEAR

1920.

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Annual Report on the Medical Research Institute for the year 1920.

MEDICAL RESEARCH INSTITUTE,
YABA,
(Near Lagos, West Africa),
18th November, 1921.

SIR,

I have the honour to present the twelfth Annual Report of the Medical Research Institute, Lagos. It includes a description of the work done between 1st January and 31st December, 1920.

2. The principal features are (1) the results of a search for the bacilli of Dysentery amongst the European and African population of Lagos. (2) the usual summary of the cases of Blackwater Fever which occurred in the Colony during the period embraced by the Report. (3) a note regarding the finding of Eimeria cysts in the gut-contents of a house-fly from Lagos, the first occasion, I believe, of the recording of this protozoon in British West Africa. (4) a record of the occurrence of a case of human Actinomycosis, in a native of the Northern Provinces, also, I believe, the first occasion when a laboratory diagnosis of this condition has been made in British West Africa. (5) a detailed description of a hitherto unrecorded species of blood-sucking fly, belonging to the genus Hippocentrum. It has been sent to the British Museum for confirmation and it may prove to be only a variety of H. trimaculatum.

3. The Report also contains a short synopsis of two papers about to be published by Dr. Young, on work done in the laboratory. These papers are "An Organism resembling Bacillus pestis" and "A Brief Note on the Histology of Goundou."

4. It will be seen, after reading this report, that the work done has been of a very varied character. For the best part of the year, one observer has dealt as best he could, with material representing every branch and speciality of Tropical Medicine and Public Health.

5. Dr. W. A. Young arrived from Sierra Leone on 26th September, 1920, to take up the duties of Assistant Bacteriologist. Thus a long-felt want was filled. The appointment means that some opportunity for the legitimate work of the Institute, that of Medical Research, will be afforded. Hitherto, except in a most restricted way, it has not been found possible to do other than ordinary routine laboratory diagnosis.

6. Mrs. Summers Connal, as usual, took over the entomological work, which is described under the heading of Medical Entomology.

7. Mr. E. F. Hines arrived from England on 1st February, 1920, to assume the post of Laboratory Attendant. This meant a relief from the tedium of media-making and other necessary processes.

8. The European Staff, therefore, has been trebled, in the period covered by this report, but it is not yet by any means adequate. The various members were on duty, as follows—Dr. A. Connal, Director, 1st January, 1920 to 14th November, 1920, Dr. W. A. Young, Assistant Bacteriologist, 26th September, 1920 to 31st December, 1920, Mr. E. F. Hines, Laboratory Attendant, 1st February, 1920 to 31st December, 1920.

9. The Native Staff consists of a Second-class clerk, Mr. S. A. Cardoso, who was on duty for the whole year and Mr. G. A. Sawyerr, a Laboratory Learner, who was appointed on 17th May, 1920 and remained on duty until 31st December, 1920. There are also a messenger, a night watchman, two animal boys and a varying number of daily labourers.

10. The urgent needs at the present time are :—

(1) an increase of the European Staff.

(2) a Branch Laboratory in or near the Hospital in Lagos, where clinical specimens can be examined in a fresh state, and whence material for further work can be obtained.

(3) an electrical supply for lighting and heating purposes in the present Laboratory buildings.

(4) a museum, library, and clerk's office elsewhere than in the Director's bungalow.

Happily, I believe that these needs are fully realised and that they will be supplied shortly.

11. From the latter part of July until October, 1920, it was a great pleasure to offer the hospitality of the Laboratories to the Yellow Fever Commission appointed by the International Health Board (Rockefeller Foundation), and valuable experience was gained by associating with the four members, General Noble, Dr. Guiteras, Professor Stokes and Dr. Tytler.

I have the honour to be,

Sir,

Your obedient Servant,

A. CONNAL,

Director, Medical Research Institute.

The Principal Medical Officer,
Lagos.

BLACKWATER FEVER.

During the year under review, thirty cases of Blackwater Fever have been reported. Under the conditions which at present obtain, many of the reports are incomplete.

The following is a summary of the information they contain. The cases from the Northern Provinces number twenty and from the Southern Provinces, ten. The atmosphere in the North is less humid, the diurnal variation of the temperature is greater and the European inhabitants are fewer, than in the South.

One female is included in the number, so that males predominate in the proportion of twenty-nine to one. It is not possible to give the proportion of male to female, in the European population, but the former greatly outnumber the latter.

The nationality, as noted in the reports, is British in twenty-six, Swiss in two, American in one and Italian in one.

Government Officials in the list number sixteen and non-officials fourteen. Included in the former are five Engine-Drivers. and two Foreman-Platelayers on the Railway, a Lieutenant and two Sergeants of the W.A.F.F., and an Engineer and a Road Foreman in the Public Works Department. The Political, Audit, Education and Agricultural Departments each supplied one case. Amongst non-officials, ten cases came from the Mercantile community, three from the Tin Mines and one from a Mission.

The age is noted in twenty-eight cases. It is given as 21 years, 23 years, 24 years in two cases, 26 years in three cases, 27 years in three cases, 28 years, 29 years in two cases, 30 years in one case, 31 years, 32 years, 33 years, 36 years in two cases, 37 years, 39 years, 43 years, 44 years in two cases, 47 years in two cases, 48 years in one case and 49 years. The age thus ranged between 21 and 49 years, one half of the total occurring under the age of thirty years, eight between the ages of 30 and 40 years and seven at ages over forty years. In the previous year, 17 out of 27 cases occurred in the age period 30–40 years.

The months in which the cases occurred were January two cases, February three cases, March two cases, April one case, May five cases, June one case, July four cases, August three cases, September four cases, October two cases and December three cases. The actual figures for North and South are given below, the wet months being underlined.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
N.	2	1	1	1	1	1	3	2	3	2	—	3
S.	—	2	1	—	4	—	1	1	1	—	—	—

On the whole, the rainy season begins later and ends sooner in the North than in the South, but no hard and fast distinction exists, for there are stations in the North as wet or wetter than some in the South.

The stations at or near which the disease declared itself were, Kano five cases, Naraguta four cases, Kaduna three cases, Abonemma, Lokoja and Zaria two cases each, and Afikpo, Ankpa, Kabba, Katsena, Lagos, Minna, Missellele, Okigwi, Onitsha, Owerri, Port Harcourt and Warri one case each.

The total period of West African residence is noted in twenty-six cases. The longest is fourteen years, and the shortest, eight months. The actual figures are, eight months, nine months, twelve months (2), thirteen months (2), fourteen months, sixteen months, two years (3), two and two-third years (2), three years (3), four years, six years (2), seven years (2), eight years, nine years, eleven years, thirteen years and fourteen years. It will be seen from these figures that there was a possibility of contracting malaria in all the cases, and indeed a history of previous attacks of malarial fever is definitely noted in 28 out of the 30 cases recorded.

As regards the length of the present tour, that is the period actually spent in West Africa since the last leave, it is given for 21 cases, as six weeks, two months, three and a half months, four months (2), six months (2), six and a half months eight months, nine months, eleven months (2), eleven and a half months, twelve months (2), thirteen months (2), fourteen months, sixteen months, twenty months and thirty-two months.

Eleven out of twenty-seven (information as regards the tour is lacking in three), contracted the disease in their first tour of service, the length of which is given as eight months, nine months, twelve months (2), thirteen months (2), fourteen months, sixteen months, two years, thirty-two months and "1st tour" (duration not stated). Six of these had no previous tropical experience. Of the remaining five, the patient noted as nine months had spent six months in Mesopotamia, the one noted as twelve months had been in Singapore, the one noted as fourteen months had resided nine months in the West Indies, the one noted as sixteen months had lived four years in India and the one noted as two years had previously served in the Gold Coast, Panama, Malay States and East Africa.

As already stated, there is a history of previous malarial attacks in twenty-eight cases. Of the remaining two, it is noted that there had been no malarial attack. The diagnosis of malaria was made by a Medical Officer in seven of these cases. As regards the others, there is no reason to doubt the statement of the twenty-one patients who stated that they suffered from malaria but who did not seek medical advice for their attacks, the disease being well-known to the laity.

The occurrence of malarial attack, as evidenced by clinical appearances or by the presence of parasites, is noted in the following cases. In the first of the series under consideration, the patient was admitted to Hospital suffering from Malarial Enteritis. He received an intra-muscular injection of Quinine Bihydrochloride grains X, on the first, second and third day of his stay in hospital. From the fourth to the eleventh day he received, orally, grains V, Quinine Hydrochloride thrice daily in solution and on the twelfth day, five hours after the second daily oral dose, he passed black water.

In case No. 2, the patient had completed thirty-two months' unbroken stay in one station, a somewhat prolonged test for a first tour. During this period he had some half-dozen attacks of Malaria, for only one of which he was treated by a Medical Officer. He treated himself for the others, by taking Quinine, going to bed and "sweating it out." Two days before his attack of Blackwater Fever, he consulted the Medical Officer because of "a cold in the head" which had developed into Bronchial Catarrh. Two days later, after a restless night with headache and a temperature of 101°F, he was put on grains V, Quinine Hydrochloride in solution, four-hourly. One hour after the second dose is the time given as the onset of Hæmoglobinuria.

The third case has a somewhat similar history. The patient sought medical advice because of asthma and "heart trouble." He was given the following mixture.

R

Quinine Hydrochlor ...	grs. v
Liq. Arsen. Hydrochlor	m iii
Ac. Hydrochlor dil ...	m vii
Syr. Tolu	m xxx
Aq. Camph. ad.	one oz.

thrice daily. On the morning of the second day after the consultation, at 4 a.m., he had a rigor and passed urine which was like Condy's fluid. The comparison is interesting, inasmuch as port, claret and porter are the usual standards.

The fourth case in the series is noted as having been on the sick-list, for malaria, for four days, the fourth day being eight days before Blackwater Fever developed. On the day before the onset, he took his regular dose of Quinine at 7 a.m. Feeling feverish, he repeated it at 7 p.m. and doubled the dose at 9.30 p.m. Nine and a half hours later his water "turned black."

Case No. 5 occurred in a man who had arrived at his station in the North suffering from fever, he having had four previous attacks in as many months at other stations in the South. Three days after his arrival, hæmoglobinuria set in.

The sixth patient had been trading on his own account for eight months (his first experience of the tropics), living a strenuous life, with no house of his own, occupying a room, or sharing it, as opportunity offered. One severe attack of Malaria was treated by a Medical Officer and "three or four others" were handled by himself. An illness ushered in with a rigor and accompanied by headache, one evening, led him to take Quinine grs. xv. Next evening, as he felt worse, he sought medical advice. He had at this time a temperature of 101°·8F., hot, dry skin, flushed face, injected eyes, enlarged liver and spleen and foul tongue. Blue pill and empirin were administered. On the third evening the temperature was 102°F. and the headache very severe. Five grains Quinine Hydrochloride were given. He had a fair night and on the fourth day the Quinine Hydrochloride was continued four-hourly. On the fifth day at 4. a.m., after a restless night, hæmoglobinuria declared itself.

Case No. 7 occurred in a patient who had fourteen years' experience of Nigeria and who had suffered from Blackwater Fever three years previously. The present tour, of four months' duration, contained two attacks of malaria, each of a week's illness, self-treated, in the month previous to the attack now noted. Feeling ill again, Quinine grs. v. were taken and four hours later, hæmoglobinuria was in evidence.

The eighth case occurred in a man who had many attacks of "Fever" in his four years' experience of West Africa. A fortnight before his fatal illness he had a severe attack of malaria ("many subtertian parasites to be seen"), and was treated by the Medical Officer with Quinine grs. v. four-hourly. Under this treatment the temperature fell to normal on the second day and he returned to work on the fifth day. He was instructed to take thereafter 25 grains Quinine daily, in five-grain doses, for a week, and fifteen grains in five-grain doses, for the ensuing fortnight. It is not known if these lines were followed. In any case, he proceeded to reduce his weight by starving, in order to qualify for a race-meeting. One week after he returned to work, he felt very ill in the evening and went to bed with his fourth five-grain dose of Quinine Hydrochloride. After a very restless night, with profuse sweating, he passed black urine at 7.30 in the morning.

Case No. 9 was under treatment for malaria (not his first attack) for three days before the onset of Blackwater Fever. The treatment was five grains Quinine Hydrochloride in solution thrice daily.

The patient in case No. 10 is described as a steady worker, and very moderate with alcohol. He had had "a few attacks of malaria" in his only previous tour, but during his present one, of 11½ months, he had felt quite well up to the morning of his actual attack of Blackwater Fever. He had been leading a frugal existence both as regards food and physical comforts. On the night before his fatal illness, he felt "extra tired" and next morning took two five grain tabloids of Quinine Bisulphate, as he felt "feverish"; eighteen hours later, he had rigors, vomiting and diarrhœa, and passed black urine.

Case No. 11 concerns a man who recovered from a severe attack of Blackwater Fever, five and a half years before his present. After recovery he went home for five years. His second stay in West Africa had reached four and a half months when he again felt ill enough to cause him to consult a Medical Officer. Quinine hydrochloride grains x. were given in solution and five hours thereafter hæmoglobinuria appeared.

The reports on cases No. 12 and No. 13 give no histories.

Case No. 14 occurred in an individual who had served twelve months of his first tour. It is noted in the history that he had had no Malaria. An attack of Enteritis lasting eight days had arisen some months previously. He had formerly been in Singapore. He stated that he took five grains Quinine, mostly the hydrochloride, daily in tabloid form. The history states that the onset was sudden.

There was eight years' total residence in West Africa to the credit of the patient in Case No. 15. He had had malaria during his leave in England, seven months previously. In his present tour of six months he had not taken Quinine regularly, he had lost two stones in weight and had suffered from an attack of diarrhœa. Three days before the onset, he had taken twenty grains Quinine, fifteen on the following day and five grains on the next, black water, heralded by rigors, ensuing some six hours after the last dose.

The history in Case No. 16 was one of malaria on several occasions in other tropical countries. He had a severe attack of malaria six months before, for which he was given liquid Quinine. He took Quinine during this attack only, otherwise he did without it. On the morning of the day of his attack, presumably feeling unwell, he took five grains Quinine Bisulphate, the blackwater appearing four hours thereafter.

The patient concerned in Case No. 17 had returned to Nigeria 3½ months previously, having spent five months in England recovering from his first attack of Blackwater Fever, which was a severe one. It is believed that he took a daily dose of Quinine. Two days before his present attack he began to "feel seedy."

The Case No. 18 gave a history of several attacks of malaria, these being the only occasions on which he took Quinine. He had gathered from the medical and lay press that Quinine is useless as a prophylactic. "Feeling unwell," he took twenty grains Quinine Hydrochloride about five hours previous to the appearance of hæmoglobinuria.

The Blackwater Fever, in Case No. 19, developed in a man who had completed fourteen months of his first tour. He suffered from malaria, shortly after his arrival. For the final eight months he had taken no Quinine at all, except for the last month. He summoned the Medical Officer on the day before his present illness, because of fever and headache. He had taken fifteen grains Quinine, in divided doses on that day. Calomel was administered. On the next day, the bowels having moved well, he was put on five grains Quinine Hydrochloride in solution and later that night, after some rigors and vomiting, blackwater was voided.

In Case No. 20, the history states that the patient had had three attacks of Malaria in this his first tour, of 13 months. He "generally remembers to take Quinine." Two days before his present attack, he took fifteen grains Quinine Hydrochloride and on the day before, ten grains, at night.

The patient in the twenty-first Case felt giddy and queer in the evening after a game of football. He said he had felt perfectly well during the day. He went to bed early. During the night he vomited several times and, having to pass urine, which caused him some pain, he noticed that it was coloured like blood. Nine months of his first tour had elapsed, at this time. Previously, he had been off duty once or twice with what was probably malaria, and undoubtedly he had had a rise of temperature now and then, but had never consulted the Medical Officer. He stated that he took a five-grain tabloid of Quinine Bihydrochloride every day at lunch time, and for the week previous to his attack he had substituted ten grains of Bisulphate in solution.

Case No. 22 occurred in a man who had completed sixteen months in West Africa, having immediately before finished four years military service in India, where he had several attacks of malaria. He awoke on the day before Hæmoglobinuria appeared, feeling dull and listless. He took five grains Quinine Hydrochloride at once. During the afternoon, headache and loin-pains came on, which became more severe towards night, the temperature rising during this time. He took another five grains of Quinine and went to bed. Bilious vomiting began early next morning, and at 10 a.m. the urine passed was black. He did not take Quinine in India except when in Hospital, but he states he took a five grain tabloid of Quinine Hydrochloride, every evening at 6.30 during his stay in West Africa.

The patient in Case No. 23 had done thirteen years of service. Previous to his present illness he had not been well for some months. He had been treating himself for fever for four days previous to his being found unconscious in a small mud rest-camp.

In Case No. 24, patient had had several previous attacks of malaria in the Belgian Congo. He had been ill for about three weeks before his present attack of Blackwater Fever. He did not take Quinine because he was told it is the cause of that disease. Case No. 25 occurred at the end of a first tour of thirteen months. During this period, the patient had six slight attacks of fever. For six weeks previous to his present illness he had been "seedy," with fever and occasional vomiting. On admission to Hospital, two days before hæmoglobinuria appeared, pigmented mononuclear leucocytes were noted in the blood. He was put on five grains Quinine Hydrochloride four-hourly. On the third day of his stay in Hospital he had a rigor, vomited, and passed urine like port-wine. The patient had been in the habit of taking Quinine Hydrochloride five grains daily but "occasionally forgot."

The patient in Case No. 26 was an irregular Quinine taker, and had suffered from Malaria both in Nigeria and in what was German East Africa. His present tour of only three months is marked by several attacks of malaria. Two days before the onset of hæmoglobinuria, presumably feeling ill, he dosed himself with 10 grains Quinine Hydrochloride, four-hourly. On the day before, he reduced it to 5 grains four-hourly.

The history in Case No. 27 is of a never very robust man, irregular in his habits as regards Quinine and other things and inclined to carelessness and excesses. He suffered from Malaria frequently and had two attacks during his last leave in England. Blackwater Fever was well established before he was seen by the Medical Officer.

Case No. 28 records that the patient had completed twelve months of his first tour, took Quinine irregularly, and had had several attacks of Malaria. Whilst in the Army in England, at which time he had never been abroad, he had an attack of Hæmoglobinuria which lasted a few hours. There was no rise of temperature nor was there a rigor or vomiting. The present attack followed about seven hours after 20 grains Quinine Bihydrochloride. The Medical Officer was called in on the following day and notes the occurrence of rigors, bilious vomiting and jaundice, with a high temperature.

In Case No. 29 the patient had been in Hospital a month previous to his present illness, suffering from Malaria. He was again in Hospital for six days before the one and only occasion on which he passed black urine. Although malarial parasites were found in his blood, both before and after this one attack occurred, the signs and symptoms were those of a Hepatitis and, indeed, the recovery was remarkably rapid when Emetine, hypodermically, was added to the Quinine treatment.

The patient in Case No. 30 was in his first tour and during the last three months had had "much fever." He stated that he took five grains Quinine regularly. On the day before hæmoglobinuria appeared he took ten grains Quinine because he felt ill. Next day he felt worse and, after a rigor in the afternoon, he took twenty grains Quinine. The blackwater was passed in the evening.

The above is a summary of the notes made by the various Medical Officers in charge of the cases. It would be unwise to draw definite conclusions, but it may fairly be inferred that it is undesirable to regard malaria lightly and to merely subdue an actual attack. The very frequent association of recurring malarial attacks, inefficiently treated, and Blackwater fever is strongly indicated, for in some of the cases the latter condition has preceded the former, and in practically all, the opposite holds good.

A previous attack of Blackwater fever or of hæmoglobinuria is noted in six cases, of which two died. The interval was eight months in Case 17 (death), three years in Case 7, four years in Case 1 and five years in Case 11 (death). In Case 28 there was an attack of hæmoglobinuria (date not stated) in England, which cleared up in a few hours and was unaccompanied by the usual signs and symptoms of true Blackwater Fever. There was a history of hæmoglobinuria, as a boy in Case 30.

The statements of the patients in regard to Quinine prophylaxis against Malaria are not to be considered too seriously, for it is quite customary in answer to the question "do you take Quinine" to receive the reply "Yes, regularly." The regularity may mean once a day or once a week. On the other hand, a confession that the prophylactic use is irregular or neglected, is mostly reliable. The habits of 29 patients are noted in the reports. Eight definitely stated that they used Quinine only in the treatment of a malarial attack. Thirteen confessed to occasionally forgetting the daily prophylactic dose or to taking it very irregularly. One patient took only 2½ grains daily. The remaining seven claimed that they took five grains daily, but three of them did not state which salt they used, or how they took it.

With reference to the treatment with Quinine, prior to the onset of Hæmoglobinuria, information is given in all but three cases. The data are put in tabular form, below. The fifth and sixth columns require explanation. The fifth column gives the total amount of Quinine taken since the onset of illness. The sixth gives the period which elapsed between the last dose of Quinine and the time when blackwater was voided.

Case.	Salt of Quinine.	Form of Administration.	Dosage.	Total amount of Quinine.	Interval between last dose and onset of blackwater.
1	Bihydrochlor	Intram.	10 grs., once, 12th day before, also on 11th day before	...	...
	Hydrochlor	Solution	5 grs., once on 11th, thrice daily thereafter (ten days)	185	5 hours.
2	do.	do.	5 grs., four-hourly	10	1 hour.
3	do.	do.	5 grs., thrice daily	15	Few hours.
4	do.	do.	5 grs., morning, 15 grs. evening	20	8 hours.
5	do.	do.	10 grs., twice daily (two days)	40	Few hours.
6	do.	do.	5 grs., four-hourly	30	$8\frac{1}{2}$ hours.
7	Hydrobrom	Tabloid	5 grs., once (double the regular daily prophylactic dose)	5	4 hours.
8	Hydrochlor	Solution	5 grs., four-hourly (nine days)	180	$11\frac{1}{2}$ hours.
9	do.	do.	5 grs., thrice daily (three days)	45	Few hours.
10	Bisulphate	Tabloid	10 grs., once	10	19 hours.
11	Hydrochlor	Solution	10 grs., once	10	5 hours.
12	Sulphate	Tabloid	10 grs., once (in addition to daily prophylactic dose)	15	?
13	do.	do.	10 grs., once	10	?
14	Hydrochlor	do.	5 grs., once	5	10 hours.
15	do.	do.	20 grs., 2nd day before, 15 grs. day before, 5 grs. on day	40	6 hours.
16	Bisulphate	?	5 grs., once	5	4 hours.
17	?	?	5 grs., once (daily prophylatic dose)	5	12 hours.
18	Hydrochlor	?	20 grs., once	20	6 hours.
19	do.	Solution	5 grs.. thrice daily	15	5 hours.
20	do.	?	5 grs., morning, 10 grs. night 2nd day before, 10 grs. day before	25	12 hours.
21	Bisulphate	Solution	10 grs., daily (eight days)	80	16 hours.
22	Hydrochlor	?	5 grs., morning and evening	10	14 hours.
25	do.	?	5 grs., four-hourly (two days)	40	6 hours.
26	do.	?	10 grs., four-hourly 2nd day before, 5 grs. day before	100	12 hours.
28	Bihydrochlor	Solution	20 grs., once	20	7 hours.
29	do.	Intram.	5 grs., 2nd day before, 10 grs. on day before	...	...
	Hydrochlor	Solution	30 grs., daily (seven days)	225	2 hours.
30	?	?	10 grs., day before, 20 grs. on day	30	2 hours.

In cases (1), (8), (26) and (29), it is as fair to say that Quinine delayed the onset of hæmoglobinuria, as to say that it precipitated the condition.

The history of the onset of the illness in each case has already been summarised. As regards the actual course of the disease, no new signs or symptoms emerge from the reports.

The duration of hæmoglobinuria in 16 cases excluding, for the moment, the cases in which relapse occurred, was 12 hours, 18 hours, 20 hours, 24 hours (two), 36 hours, 48 hours, 53 hours, 60 hours, 96 hours (six), and 7 days.

There were remissions or relapses in ten cases. In Case No. 1, the hæmoglobinuria lasted only two hours at first, but two days later it re-appeared for 24 hours. In Case No. 5 the first attack lasted five hours, the second, on the following day, four hours, and next day there was just a tinge of pink in one sample. There was a remission on the second day in Case No. 9. In Case No. 14, there was a remission on the morning of the fifth day. Seven relapses occurred in Case No. 15, clear urine being passed between each. The times were 3rd, 5th, 7th, 8th, 9th, 10th, and 11th days. In Case No. 18, there were two remissions during the five days of hæmoglobinuria. Three relapses are recorded in Case No. 20, these occurring on the 3rd, 6th and 7th days. The hæmoglobinuria in Case No. 21 lasted only 56 hours but there were seven occasions in that time when clear urine was voided, *i.e.* seven relapses. In Case No. 22, there was a relapse of 12 hours' duration occurring a fortnight after the initial attack. Case No. 30 showed two relapses, one on the fifth, and another on the 8th day, with one day of clear urine between. The times noted in the foregoing refer to the first day of hæmoglobinuria. No deaths occurred in this series of ten cases showing remission or relapses. Details regarding the remaining four cases are lacking.

Seven deaths are recorded amongst 28 cases, the result of the illness being unrecorded in two. Suppression of urine was the cause of death in five, cardiac failure in one, and Pneumonia in one. The ages in six were 24 years, 30 years, 31 years, 36 years (two), and 39 years. As already noted, there was a previous attack of Blackwater Fever in two of these cases.

Blood smears taken during the course of the illness were examined in all cases. In 13 individuals the films were searched both by the Medical Officer in charge of the case and at the Medical Research Institute. In the other ten, the films were examined only at the Research Institute and in the remaining seven the examination was done by the Medical Officer alone. Malarial parasites were found in 13 cases.

The accompanying table shows the findings in the remarks column, opposite the day of hæmoglobinuria. The five cases not accounted for therein were labelled by the Medical Officer in charge, and no slides were sent to the Research Institute. Of these, in Case 5, crescents were found on the 4th day of hæmoglobinuria, in Case No. 22 crescents and rings on the 6th day, in Case No. 28 subtertian on a day not stated, in Case No. 31 a heavy infection of subtertian on the first day, and in Case 35, subtertian on the first day.

The table gives the results also of a differential leucocyte count, and of the Arneth classification of the polymorphonuclear neutrophil leucocytes. Only the bare figures are given meantime, so that any observer who is interested may have access to them. While it may be too much to say that Arneth's classification affords aid in diagnosis, there would appear to be indications that it may be of prognostic assistance.

When a large number of cases have been examined, an attempt will be made, by co-relating temperature, relapses, remissions, and other factors, to establish a relationship.

The receipt of reports and blood films is very gratefully acknowledged, from Captain L. H. Booth, Major B. J. Courtney, Captain L. Wynne Davies, O.B.E., Dr. J. C. Franklin, Dr. W. E. Glover, Dr. K. K. Grieve, Dr. J. C. C. Hogan, Dr. G. Hungerford, Dr. W. D. Innes, Dr. W. B. Johnson, Captain C. Mackey, Dr. W. R. Parkinson, Dr. J. M. W. Pollard, Dr. J. W. Thomson and Dr. C. E. S. Watson.

Reports were also gratefully received from the following: Dr. D. Birt, Captain W. I. Martyn-Clark, Dr. A. E. Horn, Lieutenant-Colonel T. M. Russell Leonard, D.S.O., and Captain J. Lindsay.

Case.	Day of Haemoglobinuria.	Polym.	Small Lymph.	Large Lymph.	Mono.	Eos.	Trans.	Mast.	Myel.	I.	II.	III.	IV.	V.	Arneth Index.	Remarks.
1	1st.	52	18·4	4·2	19·4	0·6	4·4	0·2	0·8	62	30·8	6·4	0·8	...	92·8	
	2nd.	66·2	15·8	3·6	9·8	2·4	0·8	0·6	0·8	69·6	24·8	4·8	0·8	...	94·4	
	3rd.	42	25·2	8	18	0·4	3·6	0·4	2·4	72	24	3·6	0·2	0·2	96	
	5th.	50	21·8	7·8	13·2	1·2	3	0·2	2·8	60·8	30	7·6	1·2	0·4	90·8	
2	1st.	69	9·8	2·8	15·2	...	3	...	0·2	67·2	30·4	2·4	...	...	97·6	
	2nd.	58·4	16·4	5	15·2	0·8	3·4	0·4	0·4	60	37·2	2·8	...	...	97·2	
3	1st.	74·4	9·4	3	9·2	0·2	2·6	...	1·2	66	27·4	5·6	0·8	0·2	93·4	Subtertian.
	2nd.	75	11·2	4·2	7·2	0·2	1·2	...	1	61·6	30·6	7	0·8	...	92·2	
	3rd.	70	13·2	5·6	6·2	...	1·8	...	3·2	61·4	29	8·6	0·8	0·2	90·4	
	5th.	74·8	11·2	2·4	5·2	0·2	2	...	4·2	64·8	27·4	7·2	0·4	0·2	92·2	
4	3rd.	65·4	15·4	2	12·2	0·8	2·6	0·4	1·2	51·2	37·2	10	1·2	0·4	88·4	
6	1st.	53·8	18·2	3·6	19	1	2·2	...	2·2	65·2	29·6	4·8	0·4	...	94·8	
	2nd.	59·2	17·2	3·8	13·6	2·2	2·4	...	1·6	57·6	35·6	6·8	...	...	93·2	
8	1st.	75·2	10	1·8	10·4	...	0·6	0·2	1·8	65·2	28·8	5·6	0·4	...	94	
	2nd.	70·6	13·6	2·4	9·8	...	1	0·4	2·2	64·8	28·4	6·8	...	...	93·2	
10	2nd.	71	11	3·4	11	0·2	1·4	1	1	74	19·6	6·4	...	...	93·6	Subtertian.
	3rd.	65·8	17·8	4·8	5·8	...	1·6	0·4	3·8	77·2	18·8	3·2	0·8	...	96	
11	1st.	83	8·2	2	5	...	1·2	...	0·6	74	18	7·2	0·8	...	92	
	2nd.	74·4	16	2·4	5·2	...	1·2	...	0·8	63·2	26·4	8·8	1·6	...	89·6	
12	?	78·8	6·6	1·2	9·4	...	2·2	0·2	1·6	69·6	24·8	5·2	0·4	...	94·4	
13	?	83·6	7·2	2·2	5·4	...	1·2	...	0·4	72	22·4	4·4	1·2	...	94·4	
14	1st.	70·8	8·8	2·2	12·6	...	1·8	...	3·8	58·4	36·4	5·2	...	...	94·8	
	2nd.	64·4	16·8	3·8	10·2	...	0·8	0·4	3·6	56·8	35·2	7·6	0·4	...	92	
	3rd.	73·4	9·4	2·4	11	...	0·6	...	3·2	62·8	30·4	6·4	0·4	...	93·2	
	4th.	66·8	10·2	3·2	17·2	...	0·4	0·6	1·6	62·8	31·2	5·2	0·8	...	94	
	5th.	58·4	21·6	4·2	8·2	...	0·8	0·6	6·2	65·2	30	4·8	...	...	95·2	
	6th.	53·4	23·8	5·4	7·6	0·2	0·2	...	9·4	66	29·6	4	0·4	...	95·6	
	7th.	68·8	14·6	3·8	6·2	0·6	0·6	...	5·4	69·6	26	4	0·4	...	95·6	
	8th.	64	17·6	3·8	10·4	0·4	2·2	...	1·6	54·4	36·8	8	0·8	...	91·2	
15	1st.	47	24	4·8	20·2	0·2	3·6	...	0·2	74·8	21·2	3·6	0·4	...	96	Subtertian.
	2nd.	48	23·4	5·6	18·4	0·2	3	0·2	1·2	57·2	28·8	12·4	1·6	...	86	
	5th.	48	23·8	7·2	18·2	0·4	2	...	0·4	63·6	26	9·2	1·2	...	89·6	
	7th.	41·6	20·8	6·6	21·4	...	4·4	...	5·2	75·2	21·2	3·2	0·4	...	96·4	
	8th.	52·4	16	3·6	19·2	0·2	4	...	4·6	58·8	28·4	10·4	2·4	...	87·2	
	11th.	52	28·8	4	6·2	0·2	4	0·4	4·4	63·6	26	8·8	1·6	...	89·6	
	12th.	47	30	4	11·4	0·2	3·2	0·2	4	59·6	31·6	8·0	0·4	0·4	91·2	

Case.	Day of Haemoglobinuria.	Polym.	Small Lymph.	Large Lymph.	Mono.	Eos.	Trans.	Mast.	Myel.	I.	II.	III.	IV.	V.	Arneth Index.	Remarks.
	14th.	51·4	22	5·4	13·6	...	2·8	...	4·8	54·4	34	10·8	0·8	...	88·4	
	20th.	27·6	43·2	7·4	19·2	...	1·2	...	1·4	37·6	39·2	19·2	3·6	0·4	76·8	
18	13th.	68·4	14·2	2·8	5·6	0·4	7·2	...	6·2	59·2	27·2	11·2	2·4	...	86·4	Subtertian.
	14th.	61	21	4·2	4·6	0·2	2·4	0·2	6·4	62·4	27·2	9·6	0·4	0·4	89·6	
	16th.	64	20·2	4·8	3·8	0·4	2·4	...	4·4	57·6	30·8	11·6	...	...	88·4	
	18th.	67·4	16·8	2·6	6·6	1·2	1·2	...	4·2	54	32	12·4	1·6	...	86	
19	2nd.	77·8	14·6	2·6	3·4	0·6	0·6	0·2	0·2	70	24	4·8	1·2	...	94	
	3rd.	59·6	21·4	3·4	6·4	3·4	0·6	0·4	4·8	71·6	24·8	3·2	0·8	...	96·4	
	8th.	49	29·6	4·2	7·6	1·4	1·8	0·4	6	60·4	30·4	8·4	0·4	0·4	90·8	
20	1st.	69	8·4	3·8	16·4	...	1·6	...	0·8	52·8	37·2	8·0	2·0	...	90	Subtertian.
	2nd.	80·8	5·8	1·4	10·2	0·2	1	0·2	0·4	73·6	22·8	3·6	...	...	96·4	
	3rd.	62·6	14·8	2·8	14·2	0·2	2·2	...	3·2	64·4	30·4	5·2	...	...	94·8	
	4th.	62·4	10·2	2·8	20·2	0·2	1·2	0·4	2·6	58	34·4	6·8	0·8	...	92·4	
	19th.	74·6	5·8	2·4	14	0·2	1·8	...	1·2	62·4	24·4	12·4	0·8	...	86·8	Subtertian.
	21st.	64·6	16·4	2·2	11·4	...	1·6	...	3·8	72·8	22·4	4·8	...	...	95·2	
	22nd.	65·2	16·8	3	8	0·8	1·2	...	5	68	25·2	5·6	1·2	...	93·2	
21	1st.	66·8	12	2·6	15·4	...	3·2	...	...	74·8	19·2	5·6	0·4	...	94	Pigment.
	2nd.	63·4	15·2	3·4	15	...	2·2	...	0·8	79·6	17·6	2·4	0·4	...	97·2	Pigment.
	2nd.	60·4	16·8	3·8	16·2	0·2	1·4	0·4	0·8	75·6	20·4	3·2	0·8	...	96	
	2nd.	61	15·4	3·4	17·8	0·6	1·2	...	0·6	58·8	29·2	10·8	1·2	...	88	
	3rd.	69·8	16·2	3	4	1·2	2·8	0·2	2·8	79·6	15·2	5·2	...	...	94·8	
	5th.	55·2	22	3	8·8	2	3·6	0·2	5·2	80	14·8	4·4	0·8	...	94·8	
	7th.	58·8	19	2·8	13·4	0·8	1·4	0·2	3·6	73·6	23·2	3·2	...	...	96·8	
	9th.	62·6	16	4	9·2	0·8	1·4	0·2	5·8	64	24·8	9·2	2·0	...	88·8	
	9th.	59	17·8	3·8	11·8	0·2	1·4	0·4	5·6	71·6	22·8	4·8	0·8	...	94·4	
	11th.	58	15·8	2·8	17·4	1·2	1·4	0·2	3·2	57·2	33·6	8·8	0·4	...	90·8	
	12th.	30·6	29·6	4·2	30·6	0·6	1·6	0·2	2·6	56·8	31·6	10·8	0·8	...	88·4	
	14th.	55	14·2	4	22·4	0·4	1·8	0·6	1·6	66	29·2	4·8	...	...	95·2	Subtertian.
24	?	52·2	15·4	5·6	18·4	1·6	4	0·4	2·4	78	19·6	2·0	...	0·4	97·6	Cresc. and Pigment.
25	2 days before	61·6	12	3·2	19·8	0·6	2·8	...	...	70	27·2	2·8	...	...	97·2	Cresc. and Pigment.
	1st.	59·4	13·8	5·6	17·6	0·6	2·4	...	0·6	66·4	27·6	5·6	0·4	...	94	
29	2nd.	62·4	9·8	3·8	20·8	0·8	2·4	...	...	63·2	25·2	10·4	1·2	...	88·4	
	7th.	42·6	31·2	6·4	15·8	0·6	3·2	...	0·2	52·8	31·2	14	1·6	0·4	84	
30	3rd.	58·2	16	5·4	19·2	...	1·2	...	...	71·2	25·2	3·6	...	...	96·4	
	5th.	41·4	18·6	4·2	32·2	0·8	2·6	...	0·2	66·4	27·6	6	...	...	94	

DYSENTERY AND OTHER PROTOZOAL INFECTIONS OF THE INTESTINES.

In the annual Report for the year 1919, it was recorded that, in view of the possibility of the occurrence of Bacillary Dysentery, whether indigenous or introduced from various fields of the 1914–1918 War, it had been thought advisable to make a bacteriological examination of every specimen of fæces, particularly when the signs were those of intestinal irritation. During the final two-and-a-half months of 1919, the fæces of 62 individuals had been examined, and in no case had the bacilli of Flexner or Shiga been isolated. In the present report, which covers the work done on the same lines between 1st January and 31st December, 1920, the stools of 317 individuals have been examined. In most of the cases only one specimen was submitted, but in a number, two or three or more samples were obtained and cultures made. The procedure was, as previously outlined, to make a fine suspension of the fæces, by taking a moderate platinum loopful of the stool in 10cc of saline, and after thorough shaking, to plate out on to a McConkey medium, containing 2% instead of 1% Lactose, and using Litmus as an indicator. Any colonies which did not ferment the lactose within two days' incubation at 42°C were picked out and grown on agar slopes. After 24 hours' growth at 42°C on this medium, they were again plated on the special McConkey's medium above described and if still unable to ferment Lactose, they were sown into peptone solution containing the following sugars, Glucose, Lactose, Saccharose, Dulcite, Mannite and Maltose. If they were not ruled out by this means, their motility, their power of forming Indol, and their agglutinability with the various sera supplied by the Lister Institute, were investigated. It may be said at once, that by these means, on one occasion only in the total of 317 individual specimens examined, was a typical Flexner bacillus isolated. Agglutination tests proved it to be Bacillus dysenteriæ Flexner W. This one case occurred, towards the end of July in a patient who had an attack of acute dysentery with blood and mucus in the stools. This patient had previously been in another country, in war-time, where bacillary dysentery cases were numerous. On the present occasion there was no difficulty in recognising numerous actively phagocytic Entamœba histolytica, under the microscope, and improvement was rapid and complete with the administration of Emetine. The patient went home on leave shortly after recovery from the acute attack of Dysentery, so that there was no opportunity of investigating the possibility of a persistence of the bacillary infection.

As regards possible fallacies, the well-known tendency of the bacilli of dysentery to die out, shortly after the stool is passed, must take a prominent place. In the majority of the cases, at least 1½ hours, and sometimes up to six hours elapsed before the specimen arrived at the laboratories for plating. On the other hand, quite a large number, although the minority, arrived for examination within an hour, and some, indeed, were received and plated within five minutes of voiding. Further, any atypical strains which fermented lactose or were late lactose fermenters, have been missed, by the above routine. Also any of the various strains of Morgan's bacillus which may have occurred, have been passed over altogether. One hundred and ninety-five Europeans are included in the total of 317 individuals examined. For convenience, they have been divided into groups according to the appearance of the stool. The first group (a) includes 25, in which the motions were liquid and contained mucus, mostly blood-stained. The results were that in twenty, actively phagocytic Entamœba histolytica were present. In one, degenerated amœbae, which were not identified, were present. No amœbae were found in the remaining four cases; no blood was present and pus cells were few, the cellular elements appearing to be mainly degenerated epithelium. The second group (b) contains 46 individuals in whom the stools were liquid but without obvious mucus or blood. E. histolytica was found in six, unidentified amœbae in five, cysts of E. histolytica in three, Lamblia in three, Cercomonas in two, Endolimax nana in one, Tetramitus in one, cysts of Iodamœba bütschlii in one, and no pathogenic protozoa in the remaining twenty-four. Group (c) is made up of eleven persons in whom the stools were more or less formed, or even scybalous, with specks or strings of mucus adhering. E. histolytica was found in seven, unidentified amœbae in one, and no pathogenic protozoa in three. The last group (d) contains 113 cases in which the motions were for the most part of the soft nature common in the tropics and without obvious signs of intestinal irritation. E. histolytica occurred in eight, E. coli in seven, unidentified amœbae in six, cysts of E. histolytica in five, Lamblia in three, Endolimax nana in two, Tetramitus in one, Trichomonas in one, and no protozoa in seventy-eight.

Fæces were also examined from 122 natives. This number includes 24 female inhabitants of the neighbouring lunatic asylum and as their circumstances and habits are peculiar, they will be treated separately. The other ninety-eight natives are divided into similar groups according to the naked-eye appearances of the stool. In the first group, which contains nine individuals passing typical dysenteric motions (liquid with yellowish and reddish mucus), E. histolytica was found in all. In the second group in which the stools were liquid and without obvious mucus, E. histolytica was found in four, unidentified amœbae in three, Trichomonas in two, enormous numbers of large-sized spirochætes in one, E. histolytica cysts in one, Prowazekia in one, and no pathogenic protozoa in thirteen, making a total of twenty-five. Group (c) contains seven individuals (stools more or less formed, with drops or shreds of mucus adhering), and the findings were, E. histolytica in three, E. histolytica cysts in one, unidentified amœbae in one, Iodamœba bütschlii in one, and no protozoa in the last. The fourth group, in which the stools were of the usual character, is made up of 57 individuals. E. coli was found in six cases, unidentified amœbae in five, cysts of E. histolytica in three, vegetative E. histolytica in two, Trichomonas in two, Cercomonas in two, Iodamœba bütschlii in one and no protozoa were observed in the remaining fifty-seven cases.

The stools in the 24 asylum cases were abnormal in only three instances. Group (a) contains only one case, and E. histolytica was found in the sample. Group (b) contains a single case also, the protozoa being Trichomonas, and Group (c) is similarly made up of one case, E. histolytica being present. The findings in the 21 cases which go to group (d) were, E. coli in five, unidentified amœbae in three, Endolimax nana in two, Iodamœba bütschlii in two, E. coli and Trichomonas in two, Tetramitus in two, E. histolytica both free and encysted in one, cysts of E. histolytica and E. coli in one, E. coli and Cercomonas in one, and no protozoa in two. Reviewing the total of 317 cases, it will be seen that Groups (a) and (c) contain the largest proportion of positive findings, E. histolytica predominating. These are the groups in which mucus was present in the stools. The samples in these (a) and (c), were subjected to a more prolonged search than in the others (b) and (d), a circumstance which has no doubt influenced the results. The total number of cases of acute dysentery examined is thirty-one (excluding 4 Europeans in which the stools were liquid, with mucus, but not bloody) and E. histolytica were found in all save one, in which amœbae were observed, but not identified. From only one of the thirty-one was a dysentery bacillus isolated—the case already referred to.

It would be unjustifiable to say that Bacillary Dysentery does not exist in Lagos, but it is true to say that, in all the cases of Dysentery that have been examined at this Institute during the last fifteen months, Entamœba histolytica in an active form has been identified. A period of laboratory experience will demonstrate that it is not always possible to find Amœbae in every specimen passed in a given case of Dysentery, and if the specific treatment is well under way it may be very difficult to distinguish any at all. For this reason alone, Thomson's (1921) suggestion that Charcot Leyden crystals are pathognomonic of Amœbic Dysentery, will, if correct, prove a very valuable aid in diagnosis. It is interesting to find that Butler, writing in 1919 in the Annual Report of the Medical and Sanitary Department, Sierra Leone, 1919, has described his successful isolation of Dysentery bacilli in 19 cases. In 14 of these Flexner Y was identified, Shiga in one and inagglutinable strains in four. The only portion of the paper which may be other than acceptable is the last sentence of the first conclusion. In criticism of that portion, it may safely be said that Sierra Leone supplied the great majority of the carriers for the West African Forces in East Africa, and also that Sierra Leone has always supplied very competent Laboratory workers. The total number of specimens of Fæces examined during the period 1st January, 1920 to 31st December, 1920, is 458, but this number includes several samples from the same individual in the course of an illness, or where a definite diagnosis had not been made at the first examination.

Entamœba histolytica was observed in 99 samples; the cysts were noted in thirty-one. Entamœba coli occurred in 29, its cysts in twenty-five. Endolimax nana was seen in seven specimens. Iodamœba bütschlii was encountered in six, and its cysts in 3 cases. Amœbae not identified are noted 18 times. The other protozoa were, Lamblia 12, Trichomonas 9, Tetramitus 6, Cercomonas 5 and Prowazekia 1. In three individuals showing no other cause of diarrhœa, felted masses of spirochaetes were seen.

Helminth ova found in natives were, Ascaris 44, Tricocephalus 34, Ankylostomum 25, Tænia one, and Strongyloides ova and embryos in five. Those found in Europeans were Ascaris 1, Ankylostomum 2 and Tricocephalus 3. Blastocystis was noted in 30 samples. The material for the investigation regarding the occurrence of Bacillary Dysentery was carefully and expeditiously supplied by Dr. A. B. Aitken, Dr. K. Faderin, Dr. W. E. Glover, Dr. G. M. Gray, Dr. W. R. Parkinson, and Dr. H. H. Stewart.

With regard to the cases of chronic dysentery, described in the Annual Reports for 1918 and 1919, Group I contained 15 cases in which apparent cure had been obtained by means of Emetine intramuscularly and Alcresta by the mouth. The after-history of nine is known. All except one have had no return of their symptoms. The exception is Case (2) I.R., in which there was an acute attack of amœbic dysentery in June, 1920, from which recovery was rapid under Emetine treatment.

In Group II, which included cases which definitely improved but were not cured, three out of six have been traced, and none has shown any signs of dysentery. These three patients are those referred to in the 1919 report as having been cured and promoted to group I. Group III. embraced nine cases in which no definite improvement had taken place in 1918, but six of these were elevated to Group I. in 1919. Five of them have been traced in 1920 and have remained well.

Case (b) J.A., also remained well and got rid of his cysts.

Thomson, J. G. and Robertson, A., 1921. Trans. Roy. Soc. Trop. Med. and Hy., Vol. XV, p. 9.

LEPROSY.

Various forms of treatment have been tried during the last few years, at the neighbouring Leper Asylum. The Annual Reports of this Institute have contained the results. During the present year, it has to be recorded that 11 patients have remained well, or at least have shown no signs of active disease after the treatment by Gynocardate already detailed in the Reports for 1918 and 1919. The four patients who still show active signs of leprosy are Case L.A. (a relapse), Case A.K. (a relapse), Case C.A. in whom no form of treatment has been of avail and Case D. A. in which frequent periods of objection to treatment occur. An abstract in the Tropical Diseases Bulletin, Vol. 13, No. 1, 1919, page 5, recording the successful results obtained by Sugai (T) with Potassium cupro-cyanid in Leprosy, seemed to justify a trial of the drug in the four cases noted above. The preparation was injected intravenously in the dosage prescribed, at ten-day intervals for three months. At the end of this period there was no sign of any improvement whatsoever, and at the patients' own request the treatment was suspended.

MEDICAL ENTOMOLOGY.

Dissection of House-Flies.

At the suggestion of Dr. Rice, Director of Medical and Sanitary Services, Nigeria, an examination of the common house-flies in Lagos was made, with a view to finding the percentage of these carrying amoebic cysts.

The preliminary collection came from Yaba, all Musca domestica, 5 ♂♂ 13 ♀♀, caught in July. No amoebic cysts were found in any, but two females harboured numerous Herpetomonas. The insects were caught in the kitchen, by means of test tubes. They were promptly chloroformed, and the gut dissected out in a drop of Weigert's iodine.

During August and September, flies were obtained from several sources in Lagos. The first lot, all M. domestica, came from streets in which cases of Dysentery or Diarrhoea had been notified. Twenty-eight were collected, 24 ♂♂ 4 ♀♀, in the neighbourhood of cases of Diarrhoea. No amoebic cysts were found in any, and Herpetomonas were present in fourteen. Practically all these flies showed no visible faeces, defaecation having taken place on the sides of the test-tubes during transit. These test tubes were then quarter-filled with saline, the faeces stirred in with a platinum wire, the fluid well shaken and afterwards centrifugalised. The sediment was examined but no amoebic cysts were seen. Three females, M. domestica, taken in the neighbourhood of a case of Dysentery, also gave negative results as regards the contents of the gut, but in the sediment, after centrifugalising the products of washing the tube, one cyst of Entamoeba histolytica was found.

The second and succeeding lots of Lagos flies were collected around the refuse heaps and kilns for burning the refuse.

The second lot consisted of 44 M. domestica from a refuse heap and 14 from a kiln. All were dead on arrival at the Laboratory. Of those from the refuse heap there were two test-tubes-full, one containing 23, the other 21 individual flies. The abdomen was detached from each, ground in saline in a mortar, added to more saline, well shaken and then centrifugalised. In the sediment from the first tube, containing 23 flies, no cysts were found, but in the second, containing the crushed remains of 21 flies, one cyst of E. histolytica was seen. Fourteen flies from a kiln, in two tubes of 6 and 8 flies each, similarly treated, showed two cysts of E. coli in the tube of 6 and no cysts in the tube of eight.

The third lot of 10 M. domestica, 5 ♂♂ 5 ♀♀, all came from a refuse heap. No amoebic cysts were found. Two females harboured Herpetomonas.

The fourth lot of 15 M. domestica, 2 ♂♂ 13 ♀♀ was the most interesting. The flies were caught near a refuse-heap and all had practically no visible faeces. The two males were negative, as were also nine of the females. Of the remaining four, on dissection, one showed Eimeria cysts, another Cercomonas, the third Trichomonas and the fourth Herpetomonas. The first will be described more fully later.

The fifth lot, also from refuse-heaps, comprised 9 ♂♂ 15 ♀♀ all M. domestica and all showing little or no visible faeces. Two of these showed cysts of E. coli in the gut, another, cysts of both E. coli and E. histolytica, and two showed Cercomonas. The last lot, containing 6 ♂♂ 18 ♀♀ all M. domestica, showed no amoebic cysts in any, but 10 carried Herpetomonas in the gut, 9 of these being females.

Other flies caught near refuse heaps were as follows: Sarcophagus Sp. two females, negative: Lucilia Sp. 2 ♂♂ 4♀♀ one with cysts of E. coli and E. Histolytica and one with Herpetomonas; and Fannia Sp. 4 ♂♂ 2 ♀♀, one with Cercomonas.

With regard to the Eimeria, the batch of flies, in which was contained the particular M. domestica which harboured the cysts, was collected during the forenoon and was examined early in the afternoon, at least four hours having elapsed since the fly has fed, until the time when it was dissected. The gut was teased out in a drop of saline, transferred to a drop of strong Weigert's Iodine, and gently pressed under a coverglass. About fifteen Eimeria were seen, all in the same stage of development, *i.e.*, no segmentation had taken place. Measurements were made and the specimen ringed with paraffin. By next morning, most of the oöcysts had segmented, four sporocysts being seen. Thereafter development proceeded very slowly, doubtless on account of the iodine penetrating by degrees. By the fourth day, degeneration had set in, there being by this time somewhat indefinite signs of the formation in each sporocyst, of two sporozoites. The oöcysts are broadly oval. The length is from 25 microns–28 microns and breadth from 19 microns–22 microns. The cyst wall is composed of two layers, somewhat as described by Dobell for Eimeria oxyspora, that is, the outer somewhat incrusted, and the inner fairly thick and uniform. The sporocysts are also oval, 9 microns–14 microns in length and 6 microns–8 microns in breadth. Further description is inadvisable as the developmental processes were undoubtedly influenced by the strong solution of Iodine. The characters noted, however, are sufficient to identify the parasites as Eimeria, and probably also sufficient to justify the assumption that they correspond to none of those described by Dobell (1919) E. wenyoni, E. oxyspora and E. snijdersi as occurring in human faeces. In all probability, the present specimens came from the faeces of some of the animals haunting the refuse-heaps, goats, sheep, dogs, cats, rats or mice. Dr. R. W. Orpen, M.O.H., took a warm interest in the investigation, and arranged for the collection and despatch of all the flies.

Dobell, Clifford, 1919. "A Review of the Coccidia Parasitic in Man," Parasitology, Vol. II, No. 2, pp. 147—197.

Do. do. 1920. "A Note on the New Species of EIMERIA found in Man," by Dr. E. P. Snijders, Parasitology, Vol. 12, No. 4, pp. 433—436.

IDENTIFICATION OF HOUSEHOLD MOSQUITOES.

Collections of mosquitoes found in Government Quarters, both in Lagos and Ebute Metta, were asked for by the Principal Medical Officer, Col. Best. On various occasions during March, April and May, 1920, these collections found their way to the Research Institute. The mosquitoes identified from Lagos were Ochlerotatus irritans 17 ♀♀, Culex thalassius 3 ♂♂ 7 ♀♀, Culiciomyia nebulosa 6 ♀♀, Culex grahami 5 ♀♀, Stegomyia fasciata 3 ♀♀, and Mansoniodes africanus, Uranotaenia annulata, Anopheles costalis, Stegomyia luteocephala, Ochlerotatus nigricephalus, Culex decens and Hodgesia sanguinis 2 ♀♀ each, and Taeniorrhynchus annetti and Culex insignis 1 ♀ each, a total of 57 mosquitoes. Needless to say, there was a much larger number damaged beyond hope of identification. The mosquitoes from Ebute Metta numbered 76 identifiable, as follows:—Culiciomyia nebulosa 21 ♂♂ 25 ♀♀, Ochlerotatus irritans 1 ♀ 17 ♂♂, Culex decens 1 ♂ 3 ♀♀, Ochlerotatus nigricephalus, Culex grahami, Stegomyia fasciata, and Stegomyia luteocephala 2 ♀♀ each.

A collection of Mosquitoes received from Dr. J. R. C. Stephens, Ilorin, in July, contained Anopheles costalis 2 ♂♂ 1 ♀, Stegomyia fasciata 1 ♀ and Culex grahami 1 ♀, these being representative of the evening visitors to the bungalow.

Dr. W. D. Innes sent the following from Kano, in July. Culex univitatus 17 ♂♂ 22 ♀♀, Culex fatigans 2 ♂♂ 1 ♀, Culex decens 2 ♀♀ and Anopheles costalis, one female.

The following is a description of a species of Hippocentrum which is thought to be new, but which may prove to be only a well-marked variety of H. trimaculatum. Three female specimens, received from Dr. W. B. Johnson, Kaduna. Length between 8 and 9 mm. Wing, length 7 mm, breadth 2 mm. Clove brown in colour. Face black. Wings hyaline, with a brown interrupted patch on the upper distal half. Legs, coxae and femora brown; front tibia cream in proximal half, rest of leg brownish black; mid and hind tibiæ cream coloured.

Head. Eyes, black. Front, shining black, with short golden hairs.

Antennae, first two segments dirty yellowish brown, last segment dark brown.

Proboscis and palps, shining black.

Thorax. Clove brown with short golden hairs; no markings.

Legs, Femora, all brown; front tibia, proximal half, cream coloured, the distal half and tarsi black. On the under side, the black extends up three-quarters of the length of the tibia. Tibiae of mid and hind legs cream-coloured, the first segment cream-coloured, rest of tarsi pale brown with dark-brown apices.

Wings hyaline. A brown patch extending from the middle of the wing to the tip, and downwards to the third vein. There is an indefinite small white blotch at the proximal end of the third vein, extending round the anterior cross vein. In the middle of the brown patch, there is a broad white band reaching to the third vein. Towards the tip, there is a slightly narrower band reaching almost to the lowermost branch of the third vein.

Halteres. Cream-coloured.

Abdomen. Clove-brown, with black hairs and narrow grey bands.

The only other species of Hippocentrum reported are H. versicolor (Aust.), H. trimaculatum (Newst.), and H. murphyi (Aust.)

Austen believes H. strigipennis (Kersch) to be synonymous with H. trimaculatum. The species described above closely resembles H. trimaculatum, but can be distinguished by the following points; (if it should prove to be a new species, it is proposed to call it H. johnsoni, and if a variety, var johnsoni).

In H. johnsoni the middle band on the wing reaches to the third vein, in H. trimaculatum it stops at the first branch of the fourth vein. The wing also is narrower, in H. johnsoni, being just 2 mm. at its broadest part.

With regard to the legs, in H. trimaculatum all the tarsi are black, in H. johnsoni only the front tarsi are black. In H. trimaculatum, the front and hind tibiæ are similar in colour, being ochreous white with dark-brown apices, in H. johnsoni the mid and hind tibiæ are similar, being cream-coloured and the colouring extending to the first tarsal segment; the front tibia has the upper surface of the proximal half cream-coloured and the remainder black.

In size, H. trimaculatum is slightly the larger.

Newstead (R) 1907. "Insects and other Arthropoda collected in the Congo Free State." Ann. Trop. Med. and Paras. 1907, Vol 1, pp. 42, 43.

Austen (E.E.) 1908. " Ann. and Mag. Nat. Hist. Ser. 8, Vol 11, pp. 352 and 354.

do. 1909. "African Blood-sucking Flies." Brit. Mus. N. H. 1909.

MOSQUITO LARVAE.

The mosquito-larvae collected by the native Sanitary Inspectors during their regular visits to the compounds within the Municipal Area of Lagos, were sent, as usual, to the Research Institute for identification. For various reasons, no collections were received during January and February of 1920, and none after the end of October, 1920, so that the present report covers a period of nine months, March to October, 1920, inclusive. Each collection bore a label, giving the date, the Sanitary district and the kind of receptacle, in which the larvae were found. The collections arrived daily, and varied in number, being usually three or four but sometimes six or eight. All the available data are given in the accompanying table. It will be seen that the larvae of Stegomyia fasciata outnumber all the others together, the nearest competitor being Culiciomyia nebulosa. The others, in the order of their frequency of occurrence are Anopheles costalis, Culex fatigans, Culex decens, Culex thalassius, Ochlerotatus irritans, Uranotaenia annulata, Culex tigripes, Toxorhynchites brevipalpis, and Ochlerotatus apicoannulatus.

The following are the total numbers of the collections, not, of course, of the individual larvae. Stegomyia fasciata 452, Culiciomyia nebulosa 243, Anopheles costalis 44, Culex fatigans 23, Culex decens 11, Culex thalassius 7, Ochlerotatus irritans 3, and Uranotaenia annulata, Culex tigripes, Toxorhynchites brevipalpis and Ochlerotatus apicoannulatus one each. Cyclops were found in three of the collections. The collection, labelling and dispatch of the larvae were arranged and superintended by Dr. Pirie, Sanitary Officer, Southern Provinces.

Receptacle.	Mosquito-larvae.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
Agbo pots	Culiciomyia nebulosa	19	5	6	6	4	3	33	23	99
Do.	Stegomyia fasciata	...	...	...	...	1	...	1	...	2
Do.	Anopheles costalis	...	...	...	...	1	...	...	...	1
Do.	Culex fatigans	...	...	...	...	...	...	2	...	2
Barrels	Stegomyia fasciata	3	3	2	1	1	...	1	3	14
Do.	Culiciomyia nebulosa	...	1	1	...	...	...	...	...	2
Do.	Stegomyia fasciata Culiciomyia nebulosa	...	...	...	...	...	...	1	...	1
Do.	Culex fatigans*	...	...	...	...	...	...	...	1	1
Basin	Stegomyia fasciata	...	...	...	...	...	1	...	...	1
Bottle	Do.	...	...	1	...	...	...	...	...	1
Buckets	Do.	...	1	1	...	1	...	6	1	10
Do.	Culiciomyia nebulosa	...	...	...	...	...	...	2	...	2
Buoy	Stegomyia fasciata	...	...	...	1	...	...	...	...	1
Calabash	Do.	...	...	...	...	1	...	...	...	1
Do.	Culex fatigans	...	...	...	1	...	...	...	...	1
Do.	Culiciomyia nebulosa	...	...	...	...	...	...	...	2	2
Can	Stegomyia fasciata	...	...	...	1	...	...	...	...	1
Canoes	Culex thalassins†	...	4	1	...	...	...	...	1	6
Do.	Culex fatigans	...	...	...	...	...	1	...	...	1
Do.	Anopheles costalis	...	...	...	...	...	3	...	...	3
Catchpits	Stegomyia fasciata	1	2	2	4	3	1	3	1	17
Do.	Anopheles costalis	...	...	1	...	...	...	...	...	1
Do.	Culiciomyia nebulosa	...	...	...	...	1	...	4	5	10
Do.	Culex fatigans	...	...	...	...	...	...	...	2	2
Cement tank	Stegomyia fasciata	...	1	...	...	...	...	...	...	1
Cooking Pots	Culiciomyia nebulosa	...	...	...	...	...	...	3	2	5
Do.	Stegomyia fasciata	...	...	...	...	...	...	2	...	2
Cow-dung	Culiciomyia nebulosa	...	1	...	...	...	...	...	...	1
Crab-holes	Ochlcrotatus irritans	...	1	...	...	...	1	...	...	2
Do.	Uranotænia annulata	...	...	1	...	...	...	...	...	1
Do.	Culex fatigans	...	...	...	1	...	...	...	...	1
Do.	Culex decens	...	...	...	...	1	1	...	...	2
Do.	Anopheles costalis	...	...	...	...	...	1	...	...	1
Drums	Stegomyia fasciata	1	...	...	1	1	1	1	1	6
Do.	Culiciomyia nebulosa	...	1	...	...	...	...	...	2	3
Dye-pots	Do.	...	...	...	...	...	...	1	1	2
Do.	Stegomyia fasciata	...	...	1	...	...	...	...	...	1
Drains	Do.	...	1	2	1	1	...	1	...	6
Do.	Culex decens	...	...	...	2	...	...	...	...	2
Do.	Culex fatigans	...	...	...	2	...	...	1	2	5
Do.	Culiciomyia nebulosa	...	...	...	1	2	...	...	...	3
Do.	Anopheles costalis	...	...	...	3	2	2	...	...	7
Do.	Stegomyia fasciata, Anopheles costalis, Culex decens	...	...	...	1	...	...	...	...	1
Do.	Anopheles costalis Culex tigripes	...	...	...	...	1	...	...	...	1
Flower-pot	Stegomyia fasciata	1	...	...	...	...	...	...	...	1
Iron tank cover	Do.	...	...	...	...	1	...	...	...	1
Jug	Culiciomyia nebulosa	...	...	...	...	...	...	...	1	1
Kettle	Stegomyia fasciata	...	1	...	...	...	...	...	...	1
Lime-pot	Culiciomyia nebulosa	...	...	...	...	...	...	1	...	1
Mortar	Stegomyia fasciata	...	...	...	...	...	1	...	...	1
Pan	Culiciomyia nebulosa	...	1	...	...	...	...	...	...	1
Pools	Ochlerotatus irritans	...	1	...	...	...	...	...	...	1
Do.	Stegomyia fasciata	...	5	1	...	...	1	1	3	11
Do.	Anopheles costalis	...	...	2	8	8	7	...	...	25
Do.	Culex fatigans	...	...	...	2	4	...	...	...	6
Do.	Culiciomyia nebulosa	...	...	...	2	...	1	1	2	6
Do.	Anopheles costalis Culex decens	...	...	...	1	...	...	...	...	1
Do.	Culex thalassius	...	...	...	...	1	...	...	...	1
Puddles	Culiciomyia nebulosa	...	...	...	1	...	...	...	2	3
Do.	Stegomyia fasciata	...	...	...	...	1	...	...	...	1
Tins	Do.	1	1	2	1	...	...	1	1	7
Do.	Culiciomyia nebulosa	...	...	...	...	...	...	3	...	3
Tree-holes	Stegomyia fasciata	...	3	...	...	...	...	...	...	3
Do.	Tox. brev., Ochlerotatus apico	...	...	...	...	...	1	...	...	1
Water pots	Stegomyia fasciata	63	16	27	24	22	7	92	100	351
Do.	Culiciomyia nebulosa	10	4	...	4	1	1	42	36	98
Do.	Stegomyia fasciata Culiciomyia nebulosa	...	...	...	1	...	...	...	...	1
Do.	Culex fatigans	...	...	...	...	...	...	...	4	4
Do.	Stegomyia fasciata Anopheles costalis	...	...	...	...	...	...	..	1	1
Do.	Anopheles costalis Culex decens	...	...	...	...	...	...	...	1	1
Wells	Stegomyia fasciata	...	2	...	1	3	...	...	1	7
Do.	Culex decens	...	1	...	1	1	1	...	...	4
	Monthly Totals	99	56	51	72	63	35	203	199	778

*Water contained a solution used for tanning hides.
†Contained water brackish.

The preference of Stegomyia fasciata for clean water is well brought out in the table, the water-pots in which they bulked most largely, containing the drinking and cooking water of the household, obtained from the nearest stand-pipe supplied by the Iju Water Works. Most of the other receptacles in which they were found held rain water. Culiciomyia nebulosa, on the other hand, shows a marked preference for water in which various fermenting processes have occurred, such as in Agbo pots (a decoction of leaves used for medicinal purposes), dye-pots, dung pots and cooking pots which have contained rice, agidi, etc. It will be seen that only in the drier months March, September and October, does Culiciomyia appear largely in the water-pots. Canoes and crab-holes, although they accommodate several varieties of mosquito larvae, do not appear favourable to Stegomyia, a circumstance which is probably due to the likelihood of their containing some salt water. Apart from these two receptacles, the ubiquity of Stegomyia larvae in the others, is remarkable. It is not improbable that the invasion by Stegomyia of such a variety of receptacles is due to its being hardpressed by the anti-mosquito measures. The asterisk opposite Culex fatigans larvae in barrels indicates that the particular barrel contained a liquid which was in use for tanning hides. The cross opposite Culex thalassius larvae in canoes, indicates that the water in these receptacles was distinctly brackish.

BLOOD EXAMINATIONS.

Blood Smears from both in-patients and out-patients of the two Hospitals in Lagos were submitted for examination from time to time, but there was no definite method nor regularity, so that the results obtained do not represent the actual conditions as regards blood parasites and particularly as regards Malaria.

Blood films from a total of 276 individuals were received, many in duplicate, and at longer or shorter intervals in individual cases, so that the real total of slides examined is much higher. Two hundred were Europeans. Ring forms or crescent forms of the subtertian malarial parasite were found in 31, the crescents being found in seven. Quartan forms were observed in eight. The diagnosis of Quartan malaria was not based only on the appearance of the ring form. Where equatorial forms or gametocytes were not found in the original smears, films were taken on succeeding days, so that the identification is based, in every case, on developmental forms more advanced than the ring. Malarial infection was present in other two, as evidenced by the presence of pigment in the large mononuclear leucocytes, so that out of 200 Europeans in Lagos who consulted a medical man, 41 suffered from Malaria. The actual number of the European population is not known and the figure 41 is certainly much less than the number of those who had a malarial attack.

Other parasites in the blood were embryos of Loa loa in four cases and embryos of Acanthocheilonema perstans in one, all in smears taken during the day-time. A differential leucocyte count was made in 32 instances, 500 leucocytes being enumerated as the basis of the percentage.

The above figures are exclusive of those already detailed under the heading of Blackwater Fever.

During the first five months of the year an attempt was made to establish a relationship between irregular Quinine prophylaxis and malarial attacks. Information as regards the Quinine habits of 37 individuals was obtained. Twenty-three took Quinine irregularly or not at all and amongst this number, there were nine who showed malarial parasites in the blood. Fourteen claimed to take Quinine regularly, and one was found to have subtertian parasites. The results are by no means entirely reliable, first, because the patient's statements are taken as correct and second, because several doses of Quinine prior to examination may have cleared out the parasites. Without undue interference with the liberty of the individual, it seems impossible to get reliable data on this subject. There are no groups of people in Lagos under hard and fast rules such as would exist in a regiment or a school.

Amongst the natives, subtertian parasites were found in 10 out of 76 individuals examined, quartan parasites in three and benign tertian in one, a total of twenty. Embryos of Filaria bancrofti were found in the night-blood of one. A differential leucocyte count was made in nine cases.

To tabulate the results would be misleading. Suffice it to say that, during 1920, from April until October, this period being the wet season, there was, amongst the Europeans, more malaria than in the dry months January, February, March, November and December.

Other blood smears were examined, included interesting collections from Capt. L. H. Booth, Victoria, and Dr. K. K. Grieve, Owerri. The blood films from Lagos described above were sent by Dr. A. B. Aitken, Capt. L. H. Booth, Dr. K. Faderin, Dr. H. A. Foy, Dr. W. E. Glover, Dr. G. M. Gray, Dr. W. R. Parkinson, Dr. E. J. Quirk and Dr. H. H. Stewart. Smears were also received from Dr. G. Hungerford, Warri, Dr. W. B. Johnson, Kaduna, Dr. L. N. Lee, Akwanga, Capt. C. Mackey, Port Harcourt, and Dr. J. W. Thomson, Minna.

Examination of Urine.

Thirty-two samples were received. The result of examination was negative in 15, sugar was found and estimated quantitatively in 6, pus cells were found in 2, red-blood cells and tube-casts in 2, granular or hyaline tube-casts in 2, albumen but no tube-casts in 2, embryos of Filaria bancrofti in one and ova (terminal-spined) of Schistosomum hæmatobium in one, both these last being in natives. Hæmoglobin was present in a sample received from a case of Blackwater Fever.

Examination of Sputum.

Twenty-three specimens of sputum were examined for tubercle bacilli. The results were positive in 5, 2 Europeans and 3 natives. No helminth ova, no pathogenic fungi and no spirochætes were found in any.

Examination of Serous and other Fluids.

Three samples of fluid from the knee joint were examined. Pus cells were present in two and the causative organism cultivated. There were four specimens of Cerebro-spinal fluid. Three were negative. The diplococcus intracellularis meningitidis was present in the fourth.

Two specimens of ascitic fluid were examined, both negative.

Examination of Smears from Organs.

These form a heterogeneous collection, and are difficult to classify. Venereal conditions are under another heading.

There were eleven smears from nine organs. The only one worthy of mention concerns a smear of the exudate from a lung at postmortem. The patient, a native, had died suddenly in the fourth day of an acute illness, characterised by great prostration, high fever and signs of consolidation in the lung, with blood-stained sputum. A smear from the cut surface of the consolidated portion of the lung, showed, when stained, bipolar bacilli indistinguishable morphologically from B.

pestis. Every precaution and watchfulness were advised. No more cases developed. The fact remains that to an observer who is familiar with the post-mortem appearances of pneumonic plague, the material as received could not but suggest that condition. In this connection, it may be added that Dr. Young has written an article for publication in the Journal of Tropical Medicine and Hygiene, entitled "An Organism resembling Bacillus pestis." The organism was noted, post-mortem, in a spleen removed from a patient who had died from an illness diagnosed Paratyphoid B. The spleen was twenty-four hours old, before the bacteriological investigation was made, and was quite diffluent. Microscopic examination showed almost complete disintegration. Both in the smears from the spleen and in late stages of culture, bi-polar bacilli occurred, morphologically similar to B. pestis. The various cultural characters are noted in the paper, the negative effect on guinea-pigs, by scarification and by hypodermic injection are mentioned, and the conclusion is made that the organism was probably an air-saprophyte. The two cases mentioned, are not, of course, strictly analogous, the source of the organism and the nature of the disease being entirely different, nor was there the 24 hours' exposure of the organ to the air of a post-mortem room in the first case. Nevertheless, they are very suggestive.

EXAMINATION OF PUS.

Three smears from purulent conditions of the eye-lids were examined, no gonococci being found. Two smears from the gums in Pyorrhœa were also examined. One smear of liver pus was received and E. histolytica was identified therein. Films made from two cases of Brain abscess showed no meningococci. As regards the deep abscesses sometimes met with in natives, usually in the muscles of the thigh, three cases were investigated. Two French observers, Bouffard (1920) and Commes (1918) have described, as the causative organism in these cases, a Pasteurella, in the form of a cocco-bacillus exhibiting bipolar staining (clear space in centre) with a characteristic growth on Agar and in broth, and gram-negative. The organism in the three cases under review was noted as a diploccus in two and as a diplobacillus in one. In all three the organism was gram-negative. More careful investigation will be made when other cases occur. Other French writers and most of the Surgeons in British West Africa believe that the abscesses are of pyæmic origin and are mostly due to Staphylococci.

Young (Sierra Leone Annual Report, Medical Department, 1916, page 18) found that Gonococcal Vaccine and serum rapidly aided cure. The three cases mentioned in this report were investigated because in two of them the track was that of a psoas abscess. No tubercle bacilli was found, and the possibility of their being of amœbic origin, from a chronic inflammation of a bound-down large intestine was considered.

EXAMINATION OF SMEARS FROM VENEREAL CONDITIONS.

Seventy-six smears of urethral discharge or from material obtained after massage of the prostate, showed Gonococci in 17, and pus cells and various organisms in the remainder. Nine vaginal smears and one smear from the cervix were also examined, Gonococci being present in five. Dried films from 25 cases of Penile sore showed Treponema pallidum in seven, using Fontana's method of staining. Wassermann reactions are considered under Serum-Diagnosis. Luetic conditions in the organs are noted under the heading of Histological examinations.

Commes (Ch.) 1918 " La Pyomyosite " Bull. Soc. Path. Exot. Tome XI, 1918, pp. 822–827.

Bouffard, (G.) 1920 " De la Pyomyosite : maladie humaine a PASTEURELLA " Bull. Soc. Path. Exot. Tome XIII, 1920, pp. 398–408.

HISTOLOGICAL EXAMINATIONS.

The following is a list of the tissues examined, after fixing, imbedding and staining. There were eight specimens of spleen, of which only two are noteworthy, one showing syphilitic changes and the other forming the subject of the paper already mentioned by Dr. Young on "An organism resembling B. pestis." Seven specimens of Liver were received, two showing fatty changes, two gummatous, one tuberculous and one cirrhotic changes. Of four specimens of kidney, two showed the signs of acute Glomerular nephritis, one presented syphilitic changes and one the signs commonly associated with Blackwater Fever. Of four specimens of heart, there was fatty degeneration in two and gummata in one. There were four specimens also of intestine. One showed gummatous changes and another was from a case of amœbic dysentery. Sections from this specimen (as also from museum specimens of former years), were patiently searched for cysts of Entamœba histolytica. Although there is no doubt that the usual procedure is for the amœba to encyst in the *lumen* of the bowel and to pass out and await a suitable opportunity for re-ingestion, in the absence of the apparent need of an intermediate host it was thought possible that encystment might, in some cases, take place in the submucous or deeper layers of the large intestine. No evidence of this was found. Three specimens each of Lung, Pancreas and Stomach were sectioned.

A specimen of Appendix, removed at operation, contained Trichocephalus trichiuris. Other organs examined were Brain (2), Gall-bladder (1) and Testicle (2). A tubercular infection was present in one of the last.

Six specimens of lymphatic gland, three from the mesentery and three from the neck, all from natives, showed tubercular disease in two from the mesentery.

Granulation tissue removed from the neighbourhood of the elbow joint, in two natives, showed tubercle bacilli in one. A piece of vegetation from the aortic valve in a native, showed no spirochaetes after staining by Levaditi's method. Two small portions of Omentum have been received. One showed tubercular changes. The other was interesting inasmuch as it showed a chronic inflammatory condition due to Actinomycosis—the first occasion on which the disease has been diagnosed in this Laboratory. The following is the history of the case, given by Dr W. B. Johnson, who had charge of the patient. "Madugu, aet 37, male, Zerberma. Lived for four years at Minna before coming to hospital, previously in Zerberma country north of Argungu. Had umbilical swelling as a child, probably simple hernia. Had umbilical swelling and discharge for a few months before admission to hospital on 12th July, 1920. On admission, running irregular evening pyrexia. Mass at umbilicus, with purulent discharge. Mass in left iliac fossa and smaller mass in right iliac fossa. No bowel symtoms, no enlargement of liver. Has symptoms of Bronchitis but no physical signs in the lungs. Operation 12th August, 1920. Umbilicus excised. Mass of infiltrated omentum, adherent and herniated into umbilicus, ligatured and removed. No free fluid in abdomen. Mass in iliac fossae palpated with finger appeared to be masses of granulation tissue—no apparent connection with bowel. Steady improvement since operation, possibly due to small doses of Pot. Iod. which he has been having for lung symptoms." The patient afterwards left hospital apparently well. Histologically, the condition was of a chronic inflammatory nature, with considerable production of granulation tissue. The colonies of the parasite were small, and not numerous. Some colonies showed a very dense, interlaced network of filaments, radiating in a wavy manner outwards. Other colonies showed clubs at the periphery, their presence probably indicating an old-standing infection.

The other tissues examined were all portions of tumours. These are grouped as follows:—Sarcoma of ovary, of urethra (round celled), Osteo-sarcoma of forearm, of Metacarpus (round celled). Epithelioma of cervix, Epithelial Odontoma. Five Fibromas. One Dermoid cyst. One simple Goitre. One specimen of Goundou. Dr. Young has described the histological appearances of this last. He suggests that the tissue is of embryonic origin, and by its growth, sufficiently strong to force the thin nasal bones outwards, a view which gains support from the fact that Goundou is common in early life.

A large specimen of vesical calculus was received for the museum as were also some adult Loa loa and a head of Taenia saginata.

SERUM DIAGNOSIS.

In view of the possible institution of an anti-venereal campaign, an attempt was made to do some preliminary spade-work. It has been said by competent workers that when Wassermann Reactions are to be done, the whole day must be devoted to them. Consequently, a Wassermann day was arranged to be held twice a month and notices were sent out, to that effect, to Medical Officers. The result was that owing to transport vagaries, when the appointed day arrived, there were no specimens, although they came in by ones and twos on other days. The second drawback was that the blood in the Wright's capsule frequently arrived laked or dried or decomposed. To obviate this, it was advised that the blood be allowed to coagulate, when taken, and only the clear serum sent. In most cases, this precaution availed little, because of the shaking during transit in the post and because of the lack of ice-packing. In a few cases blister-fluid was used instead of blood serum. This proved an unsatisfactory substitute, as it was difficult to know how much the serum was diluted and, in any case, specimens from different patients varied, presumably according to the potency and the length of application of the blister.

In actual practice the only successful tests were carried out on specimens received within a few miles of the Laboratory. The inference is that Wassermann Test stations must be established at different centres in Nigeria, if the campaign is to be waged. The only alternative would be that of one or more travelling Pathologists, who would carry the necessary equipment and visit principal stations at definite periods.

It was intended to carry out the full Wassermann technique, if material were suitable, but as no definite day could be fixed, the Hecht-Fleming modification was adopted. In practically all the cases the result of the test conformed to the clinical diagnosis. Occasionally, even with a clear fresh serum the necessary amboceptor and complement were absent and required to be added.

Actually 39 Wassermann tests were performed of which 22 were negative, 16 positive and 1 partial. The number of useless specimens exceeded the total. These results give no indication of the prevalence of syphilis in the colony, just as the gonorrhoea figures by no means represent the degree of infection.

The bulk of the Wassermann work above described was done by Dr. Young and the views expressed and the conclusions reached are based on his experience.

Widal Tests were carried out in 19 cases. There was a positive reaction to Bacillus paratyphosus B in 6, to Bacillus typhosus in 3 and to all three in one (this patient had received the triple vaccine). It is quite possible that some of the nine negative results arose from changes in the serum during transit.

PUBLIC HEALTH WORK.

Samples of Water from different sources were examined bacteriologically. On fourteen occasions, sets of samples were examined from various points of the Iju Water Supply. Other samples analysed came from various Soda-Water Factories, and some from rivers, wells and springs, a total of thirty. Two examinations of soil were made. Other work included testing the suitability of a river-water for tanning purposes, and a search for traces of Arsenic in some wells near a hide-curing works. Also, a consignment of Tinned Lobster was examined on account of two outbreaks of ptomaine poisoning following its use. The percentage of alcohol was estimated in two kinds of perfume.

MEDICO-LEGAL WORK.

Four samples of stomach contents were received for analysis. Only simple tests were done, by means of watery and alcoholic solutions of dried residue or extract, administered to guinea-pigs. Three specimens of alleged "native poison" were also similarly analysed. Two cloths and one matchet were examined for blood stains. A bag of black powder, proved to be somewhat weak gun-powder.

DISEASES OF DOMESTIC ANIMALS.

Under this heading the most important specimens received were those of three dogs shot on account of suspected rabies. No Negri bodies were found in the usual sites. Material was received from nine cows. Four were specimens of lung. Tubercle bacilli were found in one; and Echinococcus veterinorum in two. Three portions of mesenteric glands did not show signs of tuberculosis. In the stomach of one cow, Cysticercus bovis was found. Fasciola gigantica was obtained from the liver of another. Metastrongylus apri was found in the lung of a pig.

The blood of five dogs was examined and trypanosomes were found in one. The fæces from three dogs showed numerous ankylostome ova in one.

The blood of three sheep and the fæces of two were examined with negative results.

The nasal discharge from a horse showed no glanders bacilli. The blood of seven others showed trypanosomes in two.

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A. CONNAL.